

MN  
SPS-7 ✓

**SPS-7 Construction Report  
Interstate 94, Eastbound  
Between Moorhead and Barnesville, Minnesota  
Sections 270701 to 270709**

**Federal Highway Administration  
LTPP Division  
North Central Region**

Report Prepared By:

Ronald R. Urbach, CET  
Benjamin J. Worel, PE  
Braun Intertec Corporation  
6875 Washington Avenue South  
P.O. Box 39108  
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June 21, 1996



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*Engineers and Scientists Serving  
the Built and Natural Environments®*

June 21, 1996

Mr. Richard C. Ingberg  
Regional Engineer  
Braun Intertec Corporation  
6875 Washington Avenue South  
P.O. Box 39108  
Minneapolis, MN 55439-0108

Dear Mr. Ingberg:

Enclosed is the Construction Report for the Minnesota SPS-7 project.

If you have any questions about this report please call Ronald Urbach or Benjamin Worel.

Sincerely,

A handwritten signature in cursive script that reads "Ronald R. Urbach".

Ronald R. Urbach, CET

A handwritten signature in cursive script that reads "Benjamin J. Worel".

Benjamin J. Worel, PE

Attachment:  
Report

c: Mr. Monte Symons, FHWA  
Mr. John Miller, PCS/Law  
Mr. Cameron Kruse, Braun Intertec

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Attachment A Minnesota LTPP Map  
Attachment B Test Section Map  
Attachment C Drilling and Sampling Plan  
Attachment D Project Deviation Report  
Attachment E Post Construction Sampling Plan

**SPS-7 Construction Report  
Interstate 94, Eastbound  
Between Moorhead and Barnesville, Minnesota  
Sections 270701 to 270709**

## **1.0 Introduction**

The SPS-7 experiment studies “Bonded Portland Cement Concrete Overlays.”

The experiment has several variables.

- Milling
- Shot blasting
- Cement grout
- No cement grout
- Overlay thicknesses of 3 inches and 5 inches

## **1.1 Experiment Cell**

The SPS-7 project is located in the wet-freeze environmental zone. It is Continuously Reinforced Concrete Pavement (CRCP) bonded overlay of CRCP original pavement. The original pavement was rated in good condition by Minnesota Department of Transportation (MnDOT) personnel.

## **1.2 Summary of Supplemental Sections**

There is one supplemental test section for this project. It is located at the east end of the project and identified as supplemental test section 270259.

## **1.3 Project Location**

The project is located between Moorhead and Barnesville, Minnesota. The control test section was placed approximately 11 miles northwest of the other nine SPS-7 test sections. The area between the control section and the other test section was a complete reconstruction project. Attachment A indicates the project location.

There are no exits between the control and the nine test sections. Attachment B is the test section layout.

## **1.4 Type of Roadway**

The existing pavement was 12 inches of sand subbase, 3 inches of Mn/DOT Class 3 subbase, 6 inches of Mn/DOT Class 5, and the CRCP was 8 inches in thickness. This pavement was open to traffic in September 1970 which make it 20 years of age before overlay. The rideability and surface distress ratings are both good as evaluated by Mn/DOT personnel.

## **1.5 Traffic Characteristics**

The traffic characteristics for this project has 16,000 vehicles in two directions. Of this, 21 percent is heavy trucks. This project was constructed for a 20 year design. The estimated total 18K ESAL in the study lane was 19,950.

## **1.6 Known Deviations From Guidelines**

See Attachment D.

## **1.7 Geometry**

The roadway alignment is relatively straight and flat.

## **1.8 Underground Structures Within Test Sections**

The test sections have been located to avoid underground structures. The underground structures are in the transition zones between test sections.

## **1.9 Installation of the Weather Station**

Not required for this

## **1.10 Installation of the WIM**

A weigh-in-motion scale (WIM) was installed in the area of the control test section.

## **1.11 Schedule for Opening to Traffic**

The SPS-7 project was constructed in the summer of 1990. Traffic was placed on the project in the fall of 1990.

## **1.12 General Problems**

No general problems were associated with the construction of this project.

## **1.13 Resident Engineer**

Skok  
Johnson  
Ingberg

## **Project Personnel**

Mr. Bud Wiborny was the project engineer.

Mn/DOT  
District 4  
Detroit Lakes, Minnesota  
(218) 847-1562

## **1.14 Material Sampling and Testing**

The preconstruction materials sampling and testing was performed by the North Central Regional Drilling and Sampling Contractor. The contact person was:

#### **1.14 Material Sampling and Testing**

The preconstruction materials sampling and testing was performed by the North Central Regional Drilling and Sampling Contractor. The contact person was:

Mr. Mark Flynn  
Braun Intertec Corporation  
6801 Washington Avenue South  
P.O. Box 39108  
Minneapolis, Minnesota 55439-0108  
(612) 941-5600

The material Sampling and Testing Plan prepared by Braun Intertec Corporation is included as Attachment C to this report.

The post construction materials sampling and testing were performed by agency personnel.

Attachment D of this report contains the post construction sampling and testing plan prepared by Braun Intertec.

#### **1.15 Contractor Information**

The contractor for the project was:

Progressive Contractors Incorporated  
8736 Zachary Lane  
Osseo, Minnesota 55369  
Project Manager was Mr. Steve Gerster

#### **1.16 Summary of Key Construction Equipment**

##### **Surface Preparation**

Shot blast machine made by Skidabrader

##### **Portland cement concrete (PCC)**

Concrete batch plant  
Slip form paver  
Belt placer with Auger spreader

#### **2.0 Project Details**

The project was designated as a SHRP Pilot Project. There was an open house sponsored by the Mn/DOT District 4, Progressive Contractors Incorporated and Concrete Paving Association of Minnesota. This open-house was held at the project on Wednesday, September 19, 1990. There were representatives from SHRP in Washington, DC, highway department personnel from Minnesota, Manitoba and North Dakota.

# CSAH 11

270701  
CONTROL SECTION  
645+00 - 650+00

↑  
11 MI.  
↓

270702  
MILLING W/ 3" OL  
1162+00 - 1167+00

270703  
MILLING W/ 3" OL  
1169+98 - 1174+98

270704  
SHOT BLASTING W/ 3" OL  
1183+50 - 1188+50

270705  
SHOT BLASTING W/ 3" OL  
1195+09 - 1200+09

270706  
SHOT BLASTING W/ 5" OL  
1205+00 - 1210+00

270707  
SHOT BLASTING W/ 5" OL  
1217+97 - 1222+97

270708  
MILLING W/ 5" OL  
1223+99 - 1228+99

270709  
MILLING W/ 5" OL  
1231+02 - 1236+02

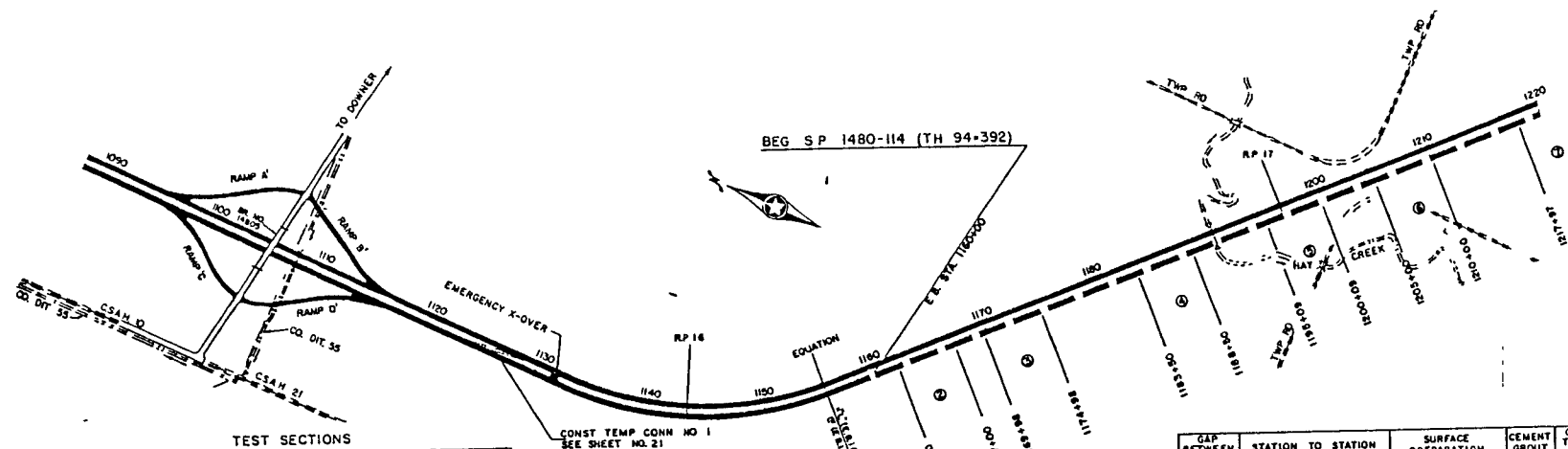
270759 (270710)  
SUPPLEMENTAL  
1257+96 - 1262+96

page 39

SPS 7 MN  
INTERSTATE 94  
18MI S. OF MOORHEAD  
SPS 270701

February 11, 1994

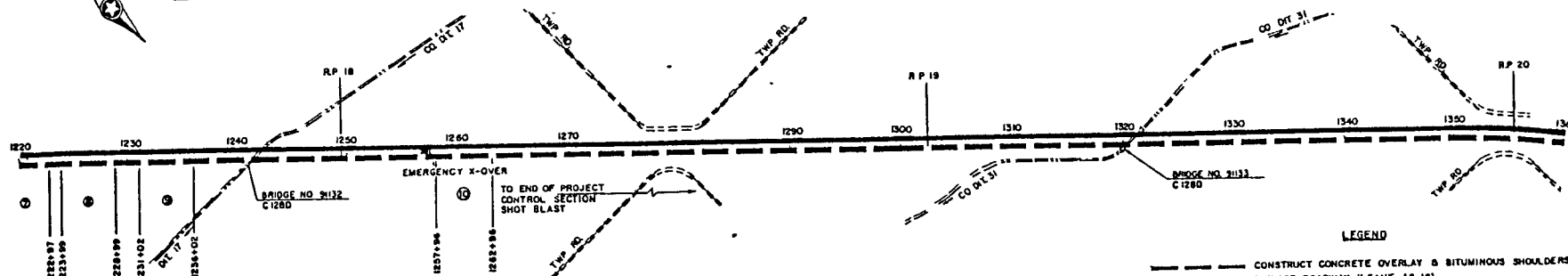
↑  
N



TEST SECTIONS

SECTION NUMBER	STATION TO STATION	SURFACE PREPARATION	CEMENT GROUT	OVERLAY THICKNESS INCHES
02	1182+00 - 1187+00	MILLING	YES	3
03	1188+98 - 1174+98	MILLING	NO	3
04	1183+50 - 1188+50	SHOT BLASTING	NO	3
05	1193+09 - 1200+09	SHOT BLASTING	YES	3
06	1205+00 - 1210+00	SHOT BLASTING	YES	5
07	1217+97 - 1222+97	SHOT BLASTING	NO	5
08	1223+99 - 1228+99	MILLING	NO	5
09	1231+02 - 1236+02	MILLING	YES	5
10	1257+96 - 1262+96	SHOT BLASTING	YES	4

GAP BETWEEN SECTION	STATION TO STATION	SURFACE PREPARATION	CEMENT GROUT	OVERLAY THICKNESS INCHES
BEG-02	1180+00 - 1182+00	MILLING	YES	3
02-03	1187+00 - 1189+98	MILLING	YES	3
03-04	1174+98 - 1183+50	SHOT BLASTING	YES	3
04-05	1188+50 - 1193+09	SHOT BLASTING	YES	3
05-06	1200+09 - 1202+09	SHOT BLASTING	YES	3-5
06-07	1202+09 - 1205+00	SHOT BLASTING	YES	5
07-08	1210+00 - 1217+97	SHOT BLASTING	YES	5
08-09	1222+97 - 1223+99	SHOT BLASTING	NO	5
09-10	1228+99 - 1231+02	MILLING	YES	5
10-END	1236+02 - 1237+02	SHOT BLASTING	YES	5-4
	1237+02 - 1237+96	SHOT BLASTING	YES	4
	1262+96 - 1268+71	SHOT BLASTING	YES	4



LEGEND

- CONSTRUCT CONCRETE OVERLAY & BITUMINOUS SHOULDERS
- INPLACE ROADWAY (LEAVE AS IS)
- CONSTRUCT BITUMINOUS X-OVER

GENERAL LAYOUT

State Proj. No. 1480-114 (TH 94-392)

Sheet No. 3 of 25 Sheets

**Table 1**

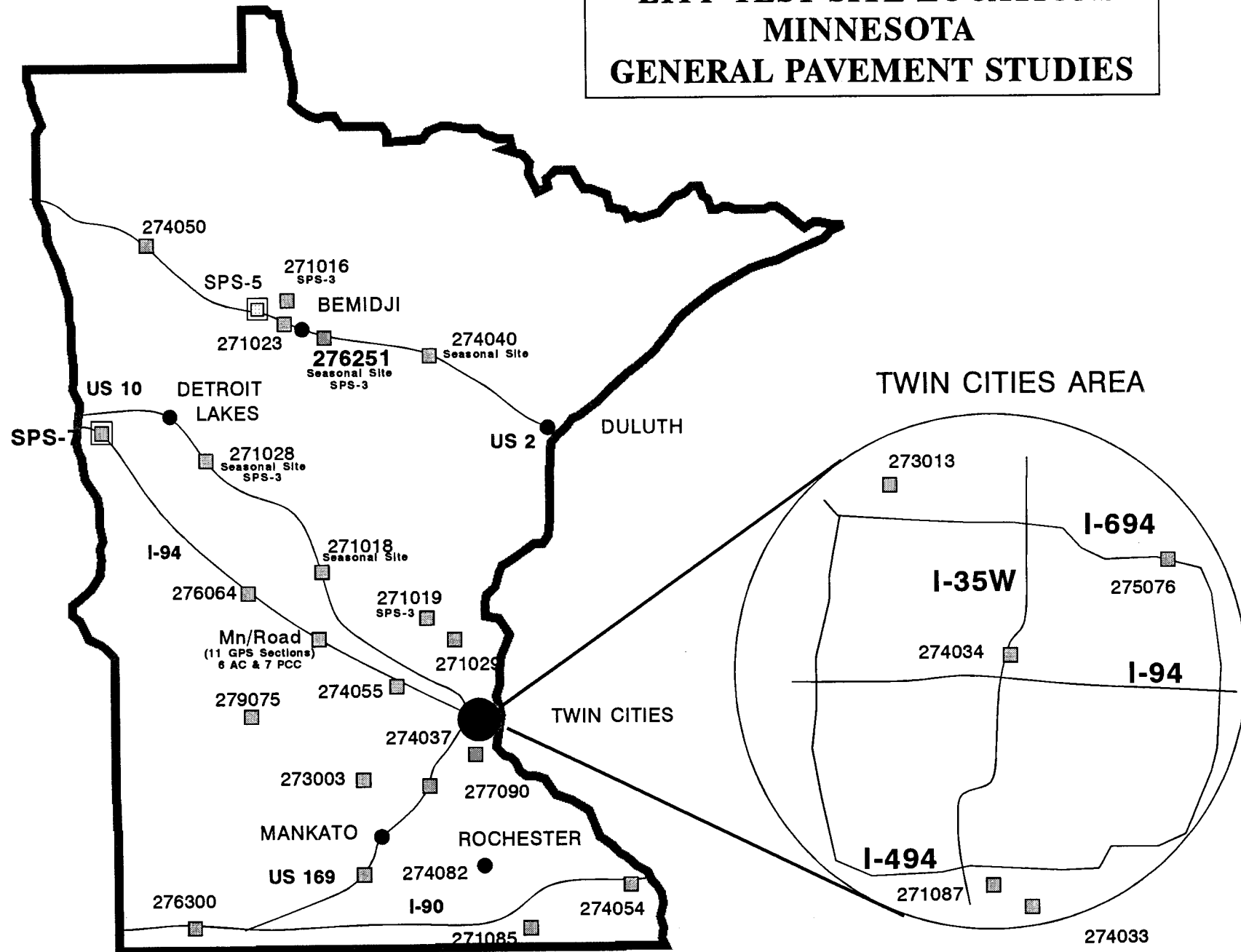
<b>Section Number</b>	<b>Type of Surface Preparation</b>	<b>Water/Cement Grout</b>	<b>Design Overlay Thickness</b>
270701	None	None	None
270702	Milling	Yes	3"
270703	Milling	None	3"
270704	Shot Blast	None	3"
270705	Shot Blast	Yes	3"
270706	Shot Blast	yes	3"
270707	Shot Blast	None	5"
270708	Milling	None	5"
270709	Milling	Yes	5"
270759	Shot Blast	Yes	4"

On all test sections retrofit subdrains were installed as part of the project.

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**Attachment A**  
**Minnesota LTPP Map**

# LTPP TEST SITE LOCATIONS MINNESOTA GENERAL PAVEMENT STUDIES



**Attachment B**  
**Test Section Map**

**Attachment C**  
**Drilling and Sampling Plan**


1404 Concordia Avenue  
St Paul, Minnesota 55104  
Phone 612/644-2996 Fax 612/644-1045



Quality Services Since 1957

August 16, 1990

MEMO TO: Richard Ingberg  
Sylvester J. Weyborny-Mn/DOT Dist 4  
Fred Maurer  
✓ Eugene L. Skok  
Amir Hanna  
Gary Elkins

FROM: Erland Lukanen 

RE: Drilling and Sampling Plan Minnesota SPS-7

A sampling plan has been prepared for the Minnesota SPS-7 project. The sample locations and types are identified on the attached sheets.

This project is unique with respect to its subgrade uniformity. It is located in the Red River Valley and there is no significant grade change throughout the entire project limits, no transition from cut to fill, no change in soil type anticipated, and we expect reasonably uniform conditions. The sample locations were distributed throughout the project.

Since the pavement on this project is continuously reinforced concrete the state is hoping to be able to do the bulk sampling through the shoulder along side the concrete in lieu of constructing test pits. The materials obtained through the shoulder are expected to be representative of the materials underneath the concrete pavement.

Please review the plan and reply with any suggestions or modifications. We anticipate that Mn/DOT would be able to do the deflection testing on the project with their own FWD during the week of August 20.

16-Aug-90

MINNESOTA SPS-7 SAMPLING PLAN

SECTION	STATION	A-TYPE 6-IN.	--- C-TYPE --- 4 INCH	6 INCH	PROBE	PIT
270701	0-50		X	X		
	2+50				X	
	5+50	X				
	5+55		X	X		
	5+60					X
270702	0-55		X	X		
	0-50	X				
	2+50				X	
270703	0-50		X	X		
270704	0-60					X
	0-55		X	X		
	0-50	X				
	5+50			X		
270705	0-50		X	X		
	5+50			X		
270706	0-55		X	X		
	0-50	X				
	5+50		X	X		
270707	5+50		X	X		
270709	0-50		X	X		
	5+50	X				
	5+55		X	X		
	5+60					X
270710	0-50		X	X		
	5+50	X				
	5+55		X	X		

TEST LOCATIONS:

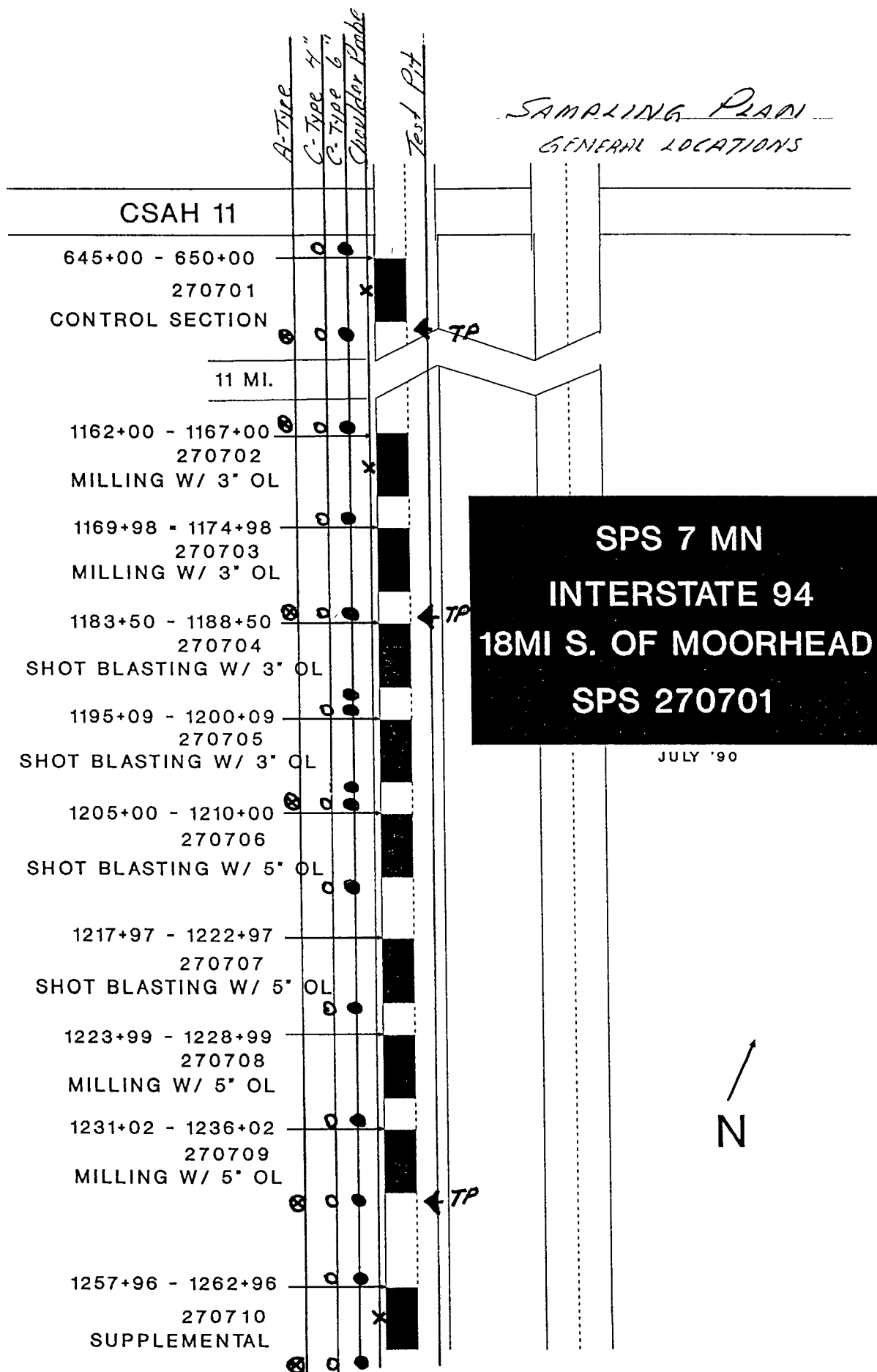
A-TYPE 9' RIGHT OF C/L.

C-TYPE 4-in. 10' RIGHT OF C/L.

C-TYPE 6-in. 8.5' RIGHT OF C/L.

SHOULDER PROBE: ADJACENT TO CONCRETE.

TEST PIT: 4' x 6' FROM OUTSIDE EDGE TO MID LANE  
USE SHOULDER FOR ALTERNATE LOCATION.



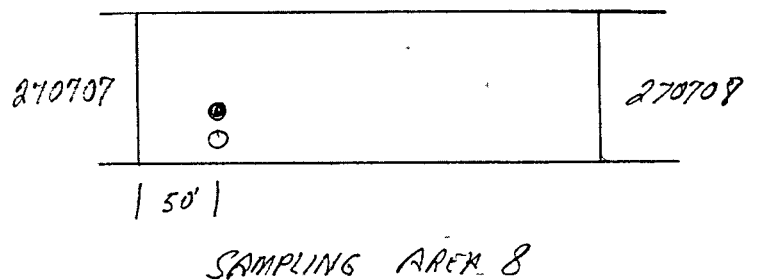
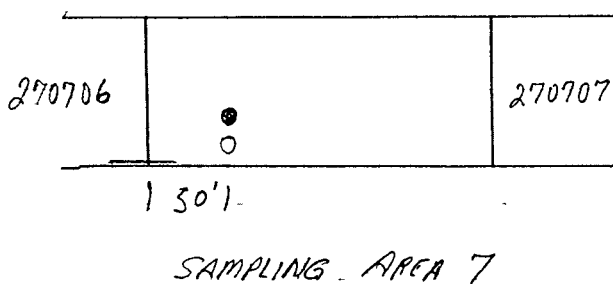
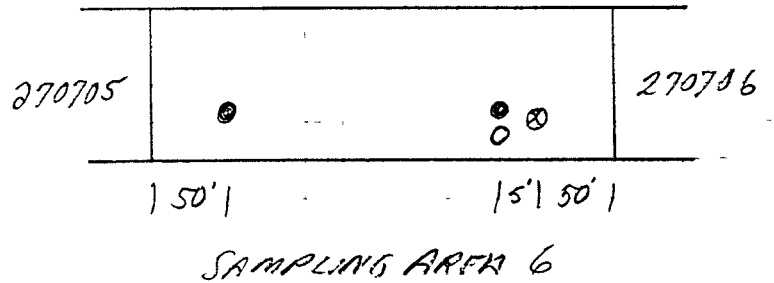
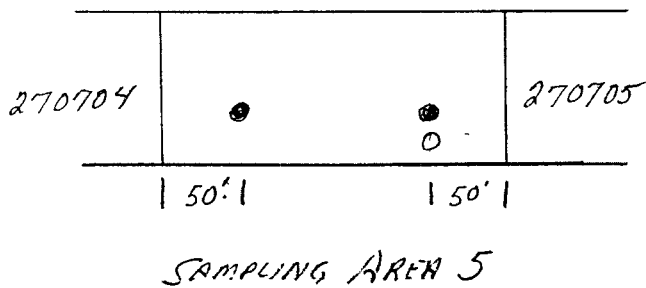
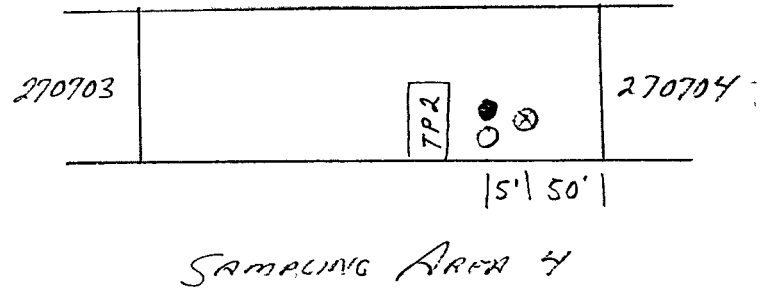
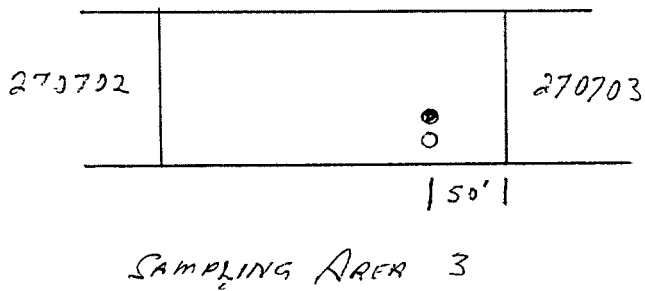
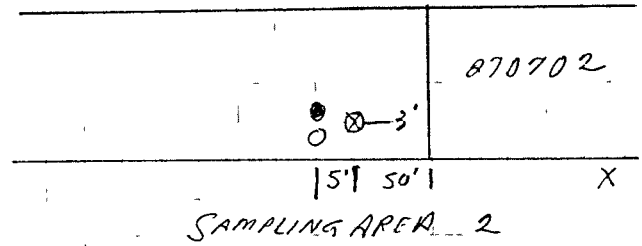
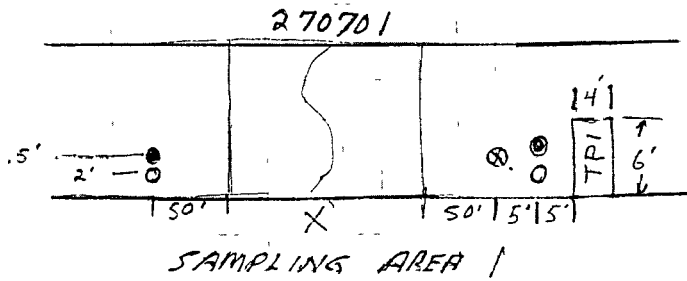
PROJECT NUMBER Mn SR-7 DESCRIPTION SAMPLING LAYOUT

**BRAUN**™

D 8/15/90

E.O.L.

SHEET 1 of 2



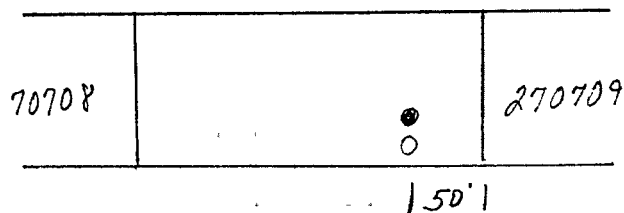
PROJECT NUMBER Mn SRS-7 DESCRIPTION SAMPLING LAYOUT

DATE 8/15/90

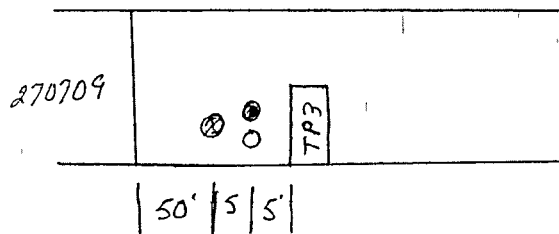
F.O.L

**BRAUP**<sup>TM</sup>

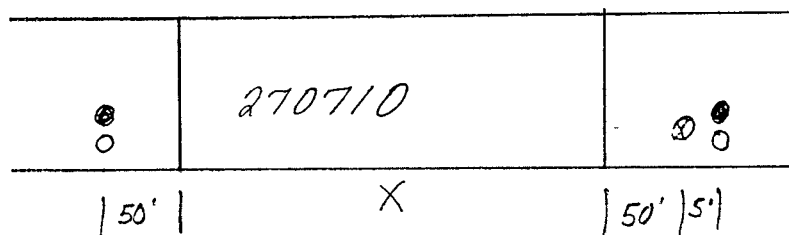
SHEET 2 of 2



SAMPLING AREA 9



SAMPLING AREA 10



X Shoulder Probe to  
20' below pavement

⊗ 6" Core, A-Type

⊙ 6" Core, C-Type

○ 4" Core, C-Type

▭ Test Pit. Bulk Sample  
area.

LEGEND

**Attachment D**  
**LTPP SPS Project Deviation Report**

Page 1 of 1                      Preparer Ronald Urbach                      Date June 26, 1996

State Code			2	7
Project Code	0	7	<u>0</u>	<u>0</u>

☐ Comments Pertain Only to Section(s): (Specify) \_\_\_\_\_

The agency performed post construction coring within the test section.

State Code			2	7
Project Code	0	7	<u>0</u>	<u>0</u>

☒ Comments Pertain Only to Section(s): (Specify) \_\_\_\_\_

Data collection and material sampling and testing guidelines were still being developed at time of construction.

Incomplete information supplied for inventory data forms. The original pavement was constructed 20 years ago.

Most of the laboratory testing was performed by the agency. The testing was completed using agency procedure and reported on non LTPP forms. The results has not been transferred to LTPP data forms. We are not sure if results of laboratory testing completed by non LTPP protocols should be put into the database.

## LTPP SPS Project Deviation Report

### Site Location Guidelines Deviations

State Code			2	7
Project Code	0	7	<u>0</u>	<u>0</u>

☒ Comments Pertain to All Test Sections on Project

☒ Comments Pertain Only to Section(s): (Specify)

### Site Location Guideline Deviation Comments

The control Section 270759 is about 15 miles away from the other test sections. No exits exist in this distance between sections.

**LTPP SPS Project Deviation Report  
Construction Guidelines Deviations**

State Code			<u>2</u>	<u>7</u>
Project Code	<u>0</u>	<u>7</u>	<u>0</u>	<u>0</u>

☒ Comments Pertain to All Test Sections on Project

☒ Comments Pertain Only to Section(s): (Specify) \_\_\_\_\_

**Construction Guidelines Deviation Comments**

The construction guidelines were still being developed at time of construction.

**LTPP SPS Project Deviation Report**  
**Other Deviations**

State Code

Project Code

0

7

2

0

7

0

☐ Comments Pertain to All Test Sections on Project

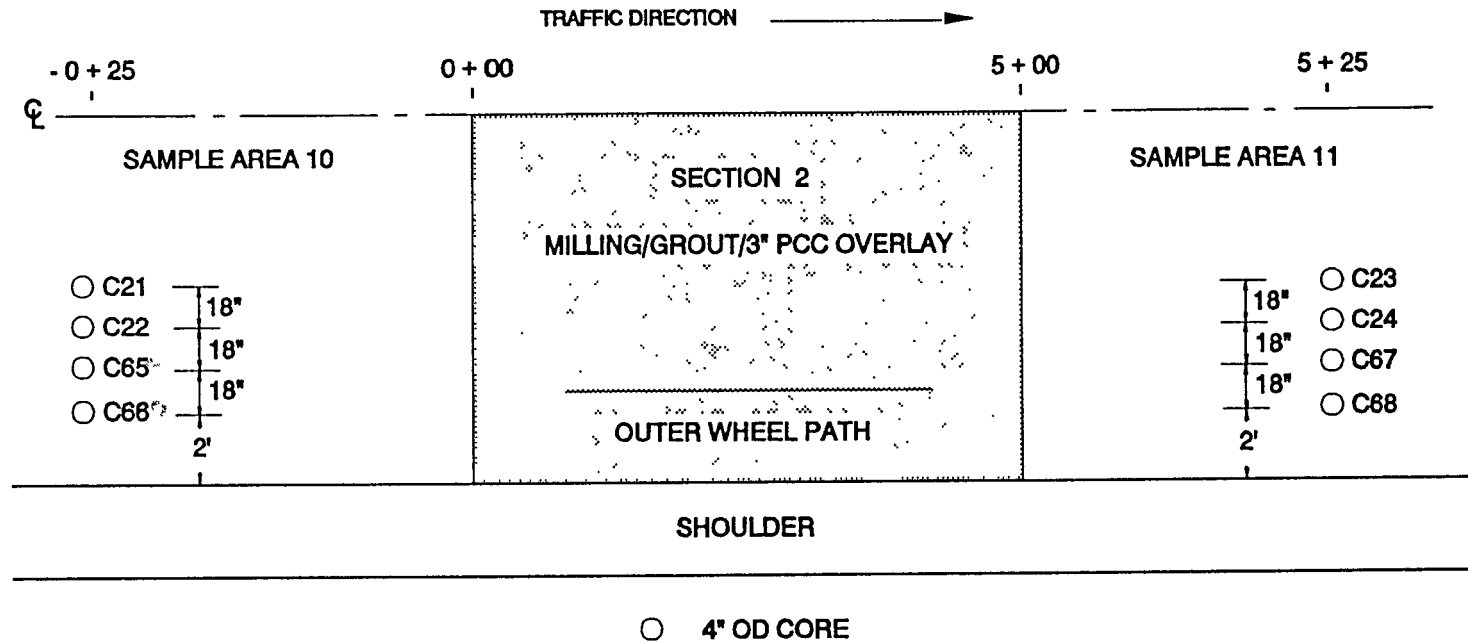
☐ Comments Pertain Only to Section(s): (Specify) \_\_\_\_\_

**Other Deviation Comments**

Subdrainage retrofits were installed on all test sections.

**Attachment E**  
**Post Construction Sampling Plan**

270702



Coring at 14 days After Placement

None for this section

Coring at 28 days After Placement

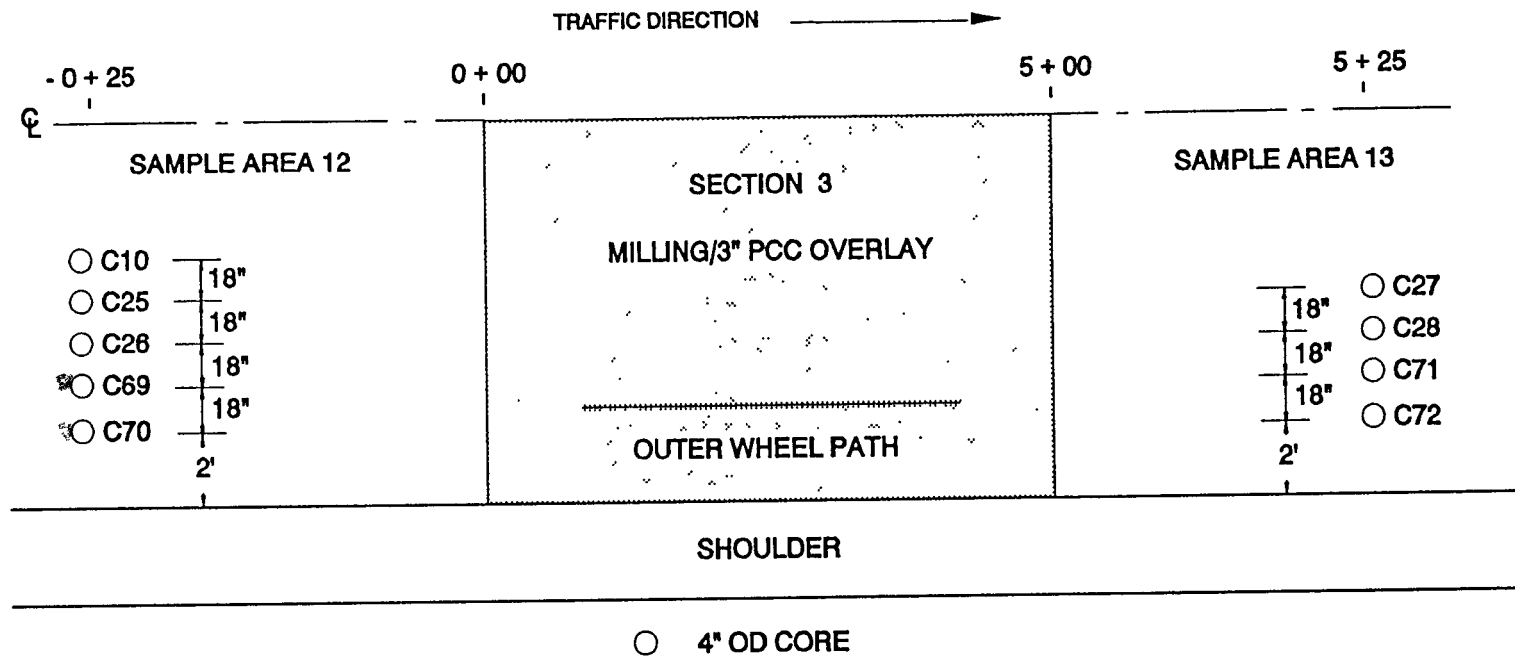
C21, C22, C23, C24

Coring at 365 days After Placement

C65, C66, C67, C68

Figure C.2 Example of "Post-Construction" Sampling Plan for Test Section 2

270703



Coring at 14 days After Placement

C10

Coring at 28 days After Placement

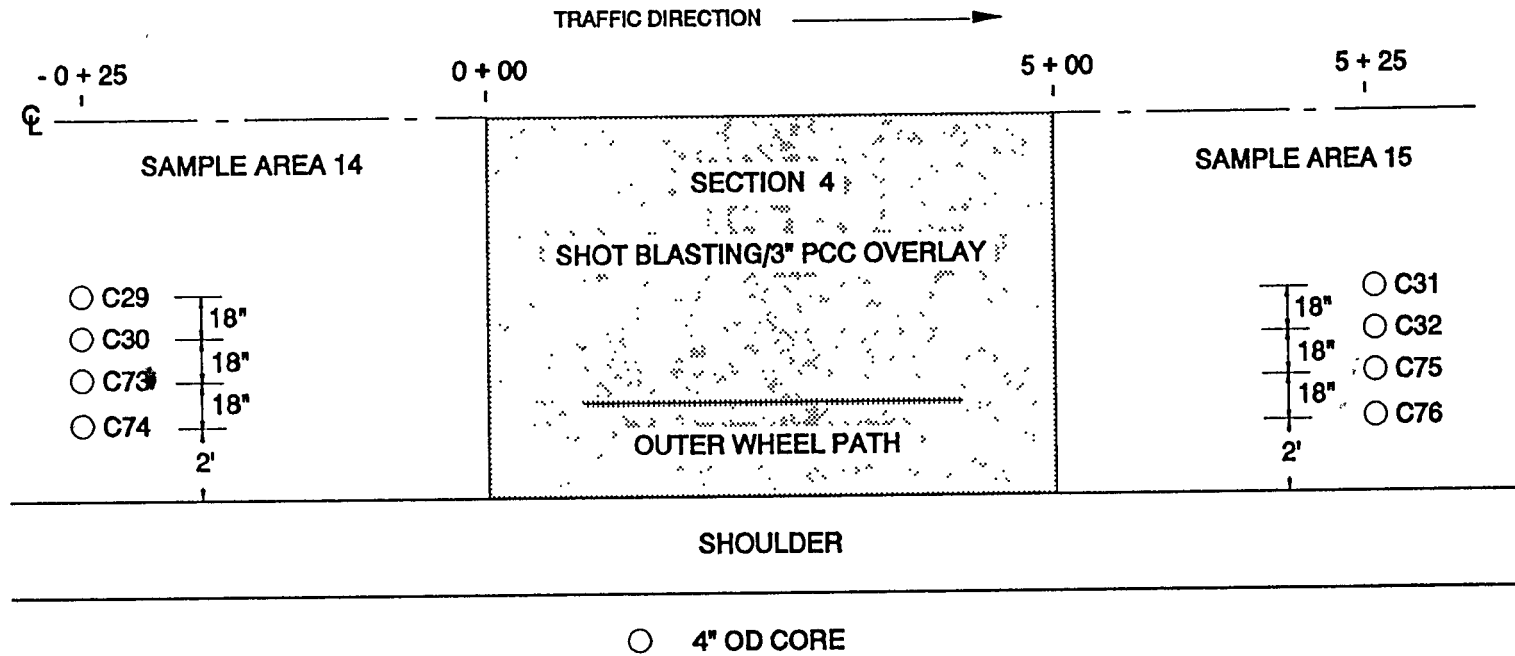
C25, C28, C27, C28

Coring at 365 days After Placement

C69, C70, C71, C72

Figure C.3 Example of "Post-Construction" Sampling Plan for Test Section 3

270704



Coring at 14 days After Placement

None for this section

Coring at 28 days After Placement

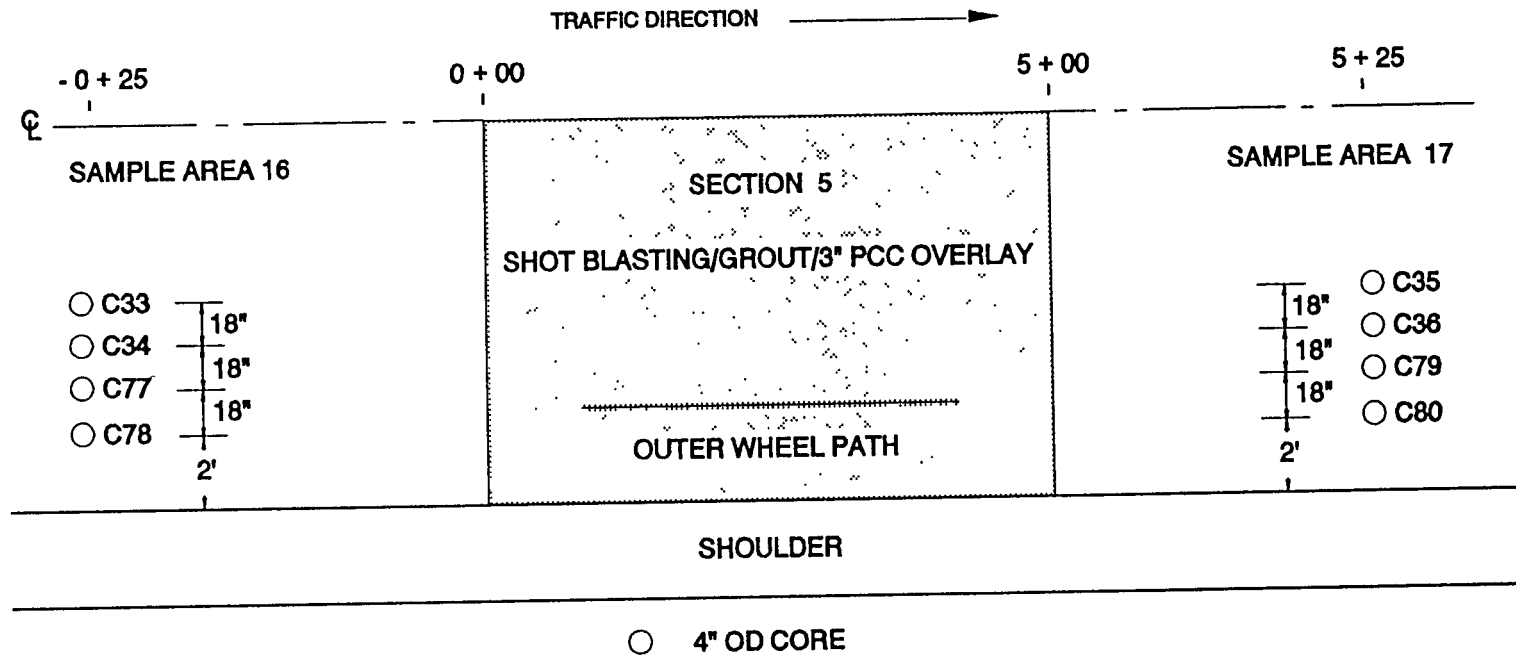
C29, C30, C31, C32

Coring at 365 days After Placement

C73, C74, C75, C76

Figure C.4 Example of "Post-Construction" Sampling Plan for Test Section 4

270705



Coring at 14 days After Placement

None for this section

Coring at 28 days After Placement

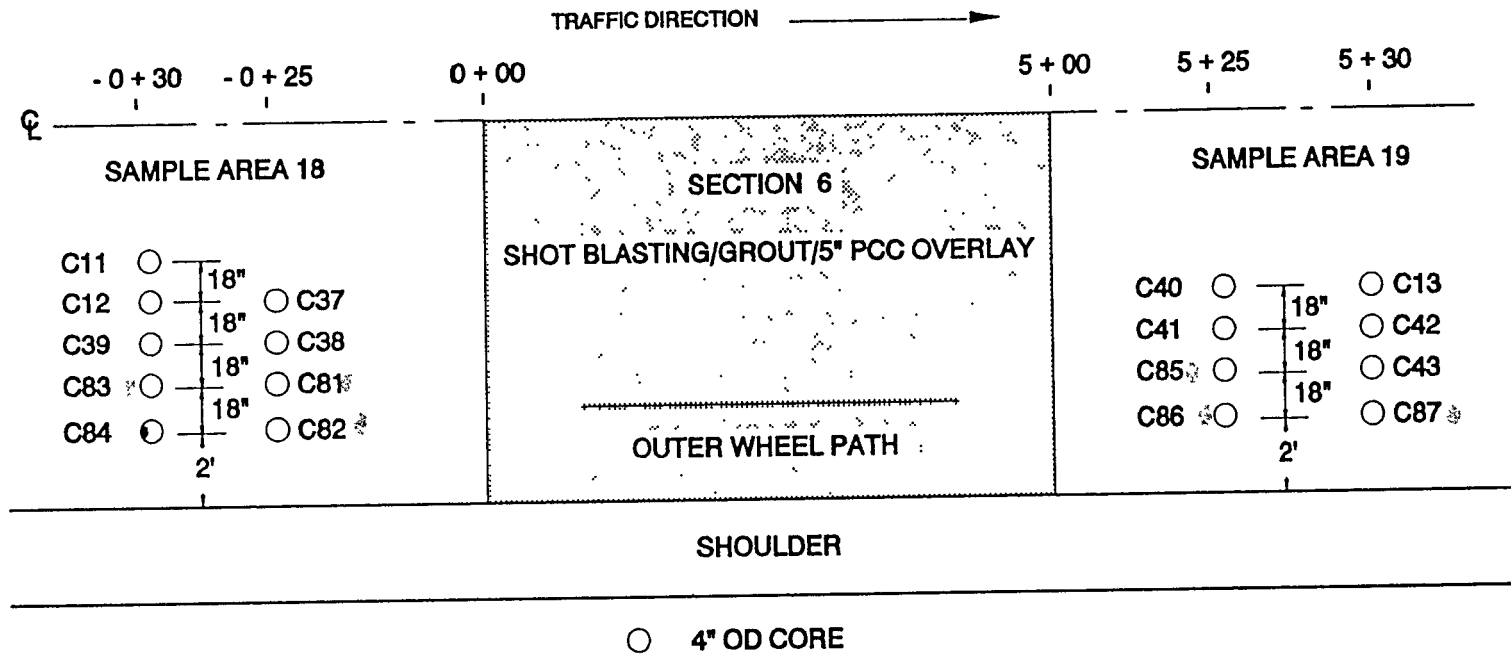
C33, C34, C35, C36

Coring at 365 days After Placement

C77, C78, C79, C80

Figure C.5 Example of "Post-Construction" Sampling Plan for Test Section 5

270706



Coring at 14 days After Placement

C11, C12, C13

Coring at 28 days After Placement

C37, C38, C39, C40

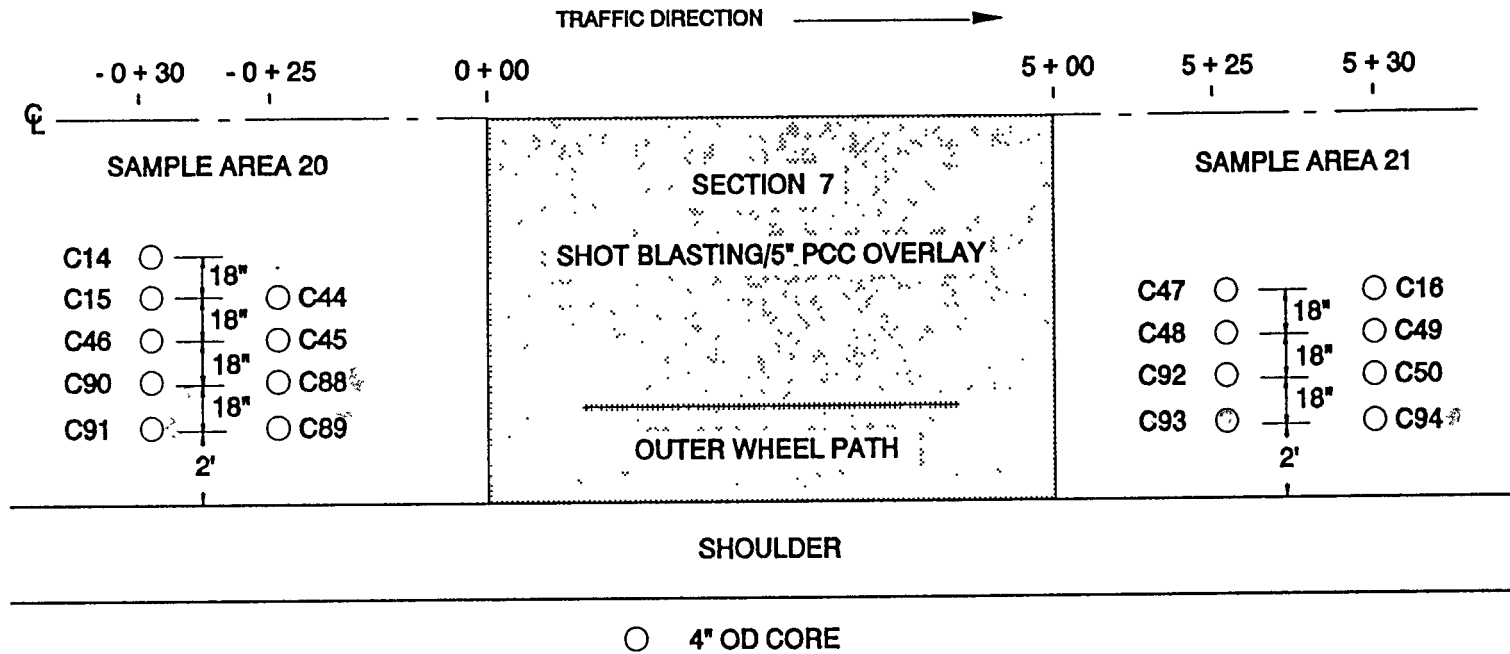
Coring at 365 days After Placement

C81, C82, C83, C84

85 86 87

Figure C.6 Example of "Post-Construction" Sampling Plan for Test Section 6

270707



Coring at 14 days After Placement

C14, C15, C16

Coring at 28 days After Placement

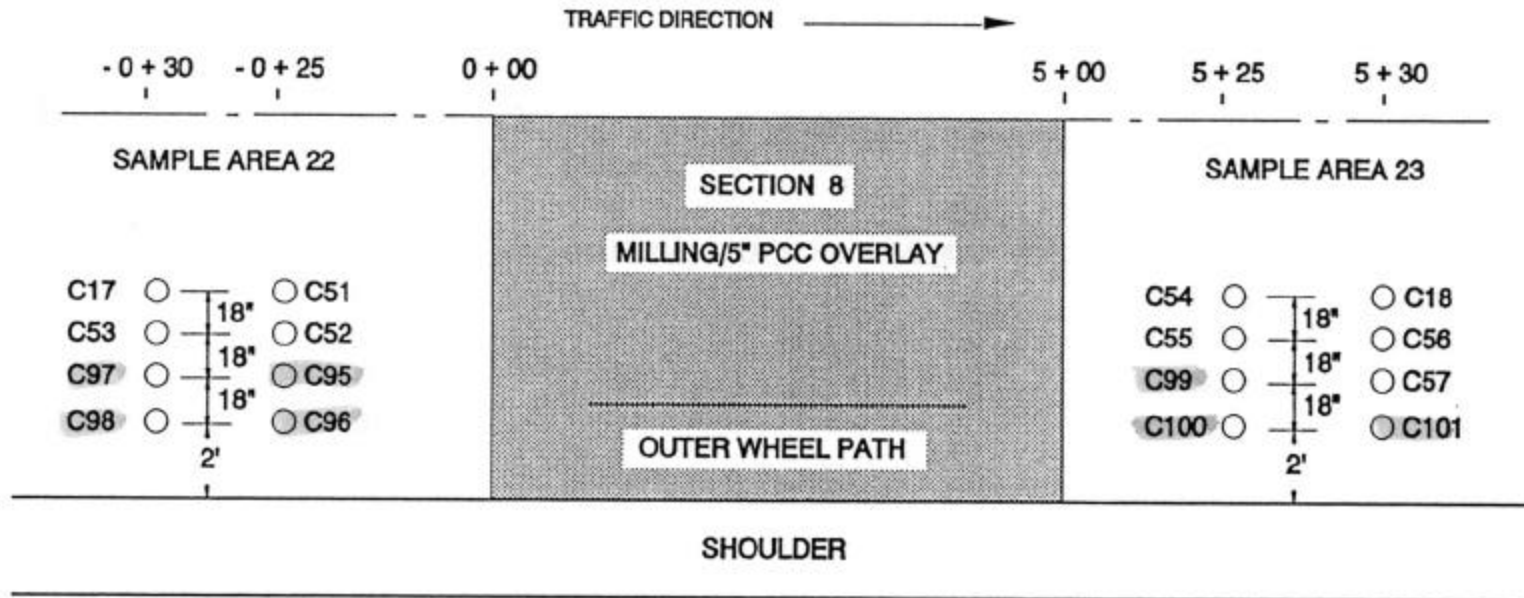
C44, C45, C46, C47, C48, C49, C50

Coring at 365 days After Placement

C88, C89, C90, C91, C92, C93, C94

Figure C.7 Example of "Post-Construction" Sampling Plan for Test Section 7

270708



○ 4" OD CORE

Coring at 14 days After Placement

C17, C18

Coring at 28 days After Placement

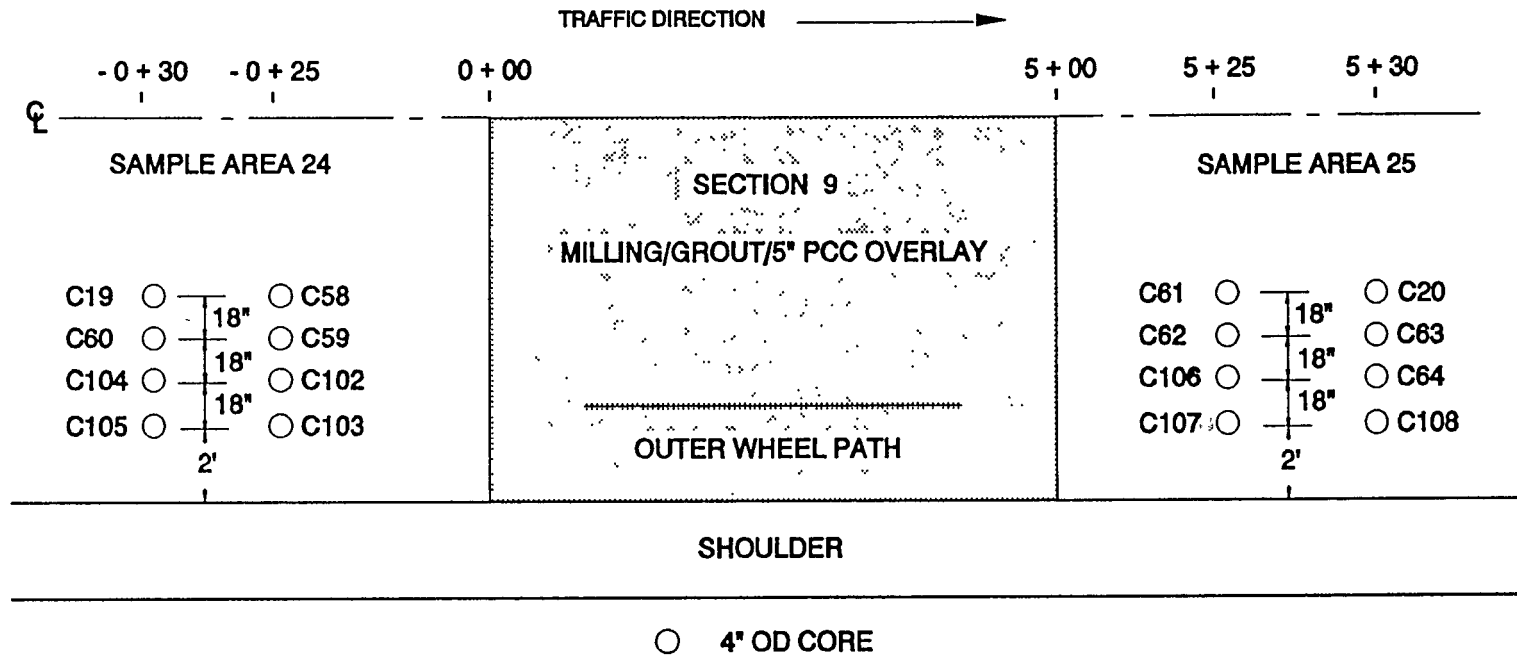
C51, C52, C53, C54, C55, C56, C57

Coring at 365 days After Placement

C95, C96, C97, C98, C99, C100, C101

Figure C.8 Example of "Post-Construction" Sampling Plan for Test Section 8

270709



Coring at 14 days After Placement

C19, C20

Coring at 28 days After Placement

C58, C59, C60, C61, C62, C63, C64

Coring at 365 days After Placement

C102, C103, C104, C105, C106, C107, C108

Figure C.9 Example of "Post-Construction" Sampling Plan for Test Section 9

SHRP PROTOCOL	LABORATORY TEST TITLE	SHRP TEST DESIGNATION(1)	APPROXIMATE AVAILABILITY(2)
------------------	--------------------------	-----------------------------	--------------------------------

(Continued)

## UNBOUND GRANULAR BASE/SUBBASE AND SUBGRADE

P41.....	Particle Size of Granular Base/Subbase.....	UG01.....	X
P41.....	Sieve Analysis (Washed) of Granular.....	UG02.....	X
	Base/Subbase		
P42.....	Hydrometer Analysis (to 0.001 mm).....	SS02.....	X
P43.....	Determination of Atterberg Limits.....	UG04, SS03.....	X
P44.....	Moisture/Density Relations.....	UG05.....	X
P46.....	Determination of Resilient Modulus.....	UG07, SS07.....	A
P47.....	Classification of Granular Base/Subbase.....	UG08.....	X
P48.....	Permeability of Granular Base/Subbase.....	UG09.....	X
P49.....	Determination of the Natural Moisture Content.....	UG10, SS09.....	X
P51.....	Sieve Analysis of Subgrade Soils.....	SS01.....	X
P51A.....	Dry Sieve Analysis of Subgrade Soils.....	SS01.....	X
P52.....	Classification/Type of Subgrade Soils.....	SS04.....	X
P54.....	Unconfined Compressive Strength of Subgrade.....	SS10.....	X
	Soils		
P55.....	Moisture-Density Relations.....	SS05.....	X
P56.....	Density of Subgrade Soils.....	SS08.....	X
P57.....	Measurement of Hydraulic Conductivity of.....	SS11.....	X
	Saturated Porous Materials Using a		
	Flexible Wall Permeameter		

## PORTLAND CEMENT CONCRETE

P61.....	Determination of the Compressive Strength of..	PC01.....	X
	In-Place Concrete		
P62.....	Determination of the Splitting Tensile.....	PC02.....	X
	Strength of In-Place Concrete		
* P63.....	Coefficient of Thermal Expansion.....	PC03.....	A
P64.....	Determination of the Static Elastic Modulus... of In-Place Concrete	PC04.....	X
P65.....	Density of PCC.....	PC05.....	X
P66.....	Visual Examination and Length Measurement of.. PCC Cores	PC06.....	X
* P67.....	Interface Bond Strength.....	PC07.....	X
P68.....	Air Content of Hardened Concrete.....	PC08.....	X
P69.....	Flexural Strength.....	PC09.....	X

## NOTE: (1) Explanation of SHRP Test Designation Numbers

AC -- Asphaltic Concrete  
 AG -- Extracted Aggregate from Asphalt Concrete  
 AE -- Asphalt Cement  
 TB -- Treated (Bound/Stabilized) Base/Subbase  
 UG -- Unbound Granular Base/Subbase  
 SS -- Subgrade Soil  
 PC -- Portland Cement Concrete

(2) X - protocol and data sheet are available in this Appendix.  
 A - protocol and data sheet are under review. Currently this protocol is under final revision and transmittal to the participating laboratories will occur in the near future.

(3) To be completed by NAA JRL.

\* FHWA

## APPENDIX E.2: SHRP PROTOCOLS FOR SPS LABORATORY TESTS

This Appendix contains SHRP protocols that are required for SHRP Specific Pavement Studies (SPS) laboratory testing. Most of the protocols are modifications of existing AASHTO and ASTM standards. The protocols provide specific directions for performing the tests when the tests are done for SHRP. In a few instances, neither AASHTO nor ASTM provides a suitable procedure and therefore a "stand alone" SHRP protocol has been developed (for example, P01). The SHRP protocol and the corresponding AASHTO or ASTM procedure (if applicable) are to be rigorously followed when testing is to be performed for SHRP. The laboratory test data sheets in this appendix are for reference only. Reproducible forms are available in Appendix C.2 of this Guide.

Please note that some protocols in this appendix contain the phrase "TO BE TRANSMITTED AT A LATER DATE". These protocols (and their appropriate data sheets) are in various stages of development and not available at this time (January 1992). The following is a list of the SHRP protocols included in this Appendix and a summary of the availability of each protocol to be used in the SPS experiments.

SHRP PROTOCOL	LABORATORY TEST TITLE	SHRP TEST DESIGNATION(1)	APPROXIMATE AVAILABILITY(2)
<b>ASPHALTIC CONCRETE</b>			
P01.....	Core Examination and Thickness.....	AC01.....	X
P02.....	Determination of Bulk Specific Gravity.....	AC02.....	X
P03.....	Determination of Maximum Specific Gravity.....	AC03.....	X
P04.....	Determination of Asphalt Content (Extraction).....	AC04.....	X
P05.....	Moisture Susceptibility.....	AC05.....	A
P06.....	Creep Compliance.....	AC06.....	A
P07.....	Determination of the Resilient Modulus.....	AC07.....	A
<b>EXTRACTED AGGREGATE</b>			
P11.....	Specific Gravity of Coarse Aggregate.....	AG01.....	X
P12.....	Specific Gravity of Fine Aggregate.....	AG02.....	X
P14.....	Gradation of Aggregate.....	AG04.....	X
P14A(3).....	Fine Aggregate Particle Shape Test.....	AG05.....	X
<b>ASPHALT CEMENT</b>			
P21.....	Abson Recovery.....	AE01.....	X
P22.....	Penetration at 77°F and 115°F.....	AE02.....	X
P23.....	Specific Gravity at 60°F.....	AE03.....	X
P24.....	Viscosity at 77°F.....	AE04.....	X
P25.....	Viscosity at 140°F and 275°F.....	AE05.....	X
<b>TREATED BASE/SUBBASE MATERIALS</b>			
P31.....	Type and Classification of Material and..... Type of Treatment	TB01.....	X
P32.....	Unconfined Compressive Strength of Treated.... Base/Subbase	TB02.....	X
P33.....	Determination of Resilient Modulus of Treated..... Base/Subbase	TB03.....	A

Table 4. POST-CONSTRUCTION LABORATORY TESTING PLANS

Material Type and Properties	SHRP Designation	SHRP Protocol	Tests per Layer	Material Source/ Test Locations
POST-CONSTRUCTION				
I. PORTLAND CEMENT CONCRETE OVERLAY:				
Compressive Strength				
14 day	PC01	P61	4	C12 C15 C17 C19
28 day	PC01	P61	4	C43 C50 C57 C64
365 day	PC01	P61	4	C86, C93 C100 C107
Splitting Tensile Strength				
14 day	PC02	P62	4	C13 C16 C18 C20
28 day	PC02	P62	4	C39 C46 C53 C60
365 day *	PC02	P62	4	C87 C94 C101 C108
PCC Coefficient of Thermal Expansion *				
14 day	PC03	P63	1	C11
Static Modulus of Elasticity				
28 day	PC04	P64	4	C42 C49 C56 C63
365 day	PC04	P64	4	C83 C90 C97 C104
Interface Bond Strength				
28 day	PC07	P67	32	C21-36 C37-38 C40-41 C44-45 C47-48 C85-52 C54-55
365 day	PC07	P67	32	C58-59 C61-62 C65-80 C81-82 C85-86 C88-89 C92-93 C95-96 C99-100 C102-103 C106-107
Air Content of Hardened Concrete				
14 day	PC08	P68	2	C10 C14
PCC Unit Weight				
14 day	PC05	P65	4	C12 C15 C17 C19
28 day	PC05	P65	4	C43 C50 C57 C64
365 day	PC05	P65	4	C86 C93 C100 C107
Core Examination / Thickness				
	PC06	P66	99	C10-20 C21-64 C65-108
II. PORTLAND CEMENT CONCRETE ORIGINAL PAVEMENT:				
Compressive Strength				
Splitting Tensile Strength				
PCC Coefficient of Thermal Expansion *				
Static Modulus of Elasticity				
PCC Unit Weight				
Core Examination / Thickness				
	PC01	P61	9	C21 C25 C29 C33 C37 C44 C51 C58
	PC02	P62	9	C23 C27 C31 C35 C40 C47 C54 C61
	PC03	P63	1	C11
	PC04	P64	9	C22 C25 C30 C34 C38 C45 C52 C59
	PC05	P65	9	C21 C25 C29 C33 C37 C44 C51 C58
	PC06	P66	47	C10-20 C21-64 C65-108

\* Test to be performed by FHWA